

APPLICATION FOR FEDERAL ASSISTANCE

| | | | | |
|--|------------------------------|---|--|--------------------------|
| 1. TYPE OF SUBMISSION | | 2. DATE SUBMITTED 7/18/06 | Applicant Identifier N/A | |
| <i>Application</i> <input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction | | 3. DATE RECEIVED BY STATE N/A | State Application Identifier N/A | |
| <i>Pre-application</i> <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction | | 4. DATE RECEIVED BY AGENCY | Federal Identifier AIP 3-20-0088-50 | |
| 5. APPLICANT INFORMATION | | | | |
| Legal Name: Wichita Airport Authority | | Organizational Unit: Wichita Airport Authority | | |
| Organizational DUNS: 124970641 | | Department: | | |
| Address: Street: 2173 Air Cargo Road | | Division: | | |
| City: Wichita | | Name and telephone of person to be contacted on matters involving this application (give area code) | | |
| County: Sedgwick | | Prefix: Mr. | First Name: Victor | |
| State: Kansas Zip Code: 67209 | | Middle Name: | | |
| Country: United States | | Last Name: White | | |
| | | Suffix: | | |
| 6. EMPLOYER IDENTIFICATION NUMBER (EIN): 4 8 - 6 0 0 0 6 5 3 | | Email: VWhite@Wichita.gov | | |
| | | Phone Number (give area code) (316) 946 - 4700 | Fax Number (give area code) (316) 946 - 1898 | |
| 8. TYPE OF APPLICATION <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision If Revision, enter appropriate letter(s) in box(es) (See back of form for description of letters.) Other (specify) <input type="checkbox"/> <input type="checkbox"/> | | 7. TYPE OF APPLICANT (See back of form for Application Types) C Other (Specify): | | |
| 10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NO. 2 0 - 1 0 6 | | 9. NAME OF FEDERAL AGENCY: Federal Aviation Administration | | |
| TITLE (Name of Program): Airport Improvement Program | | 11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: Pavement condition inventory for Wichita Mid-Continent and Colonel James Jabara Airports | | |
| 12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.): Wichita, Sedgwick County, Kansas | | | | |
| 13. PROPOSED PROJECT | | 14. CONGRESSIONAL DISTRICTS OF: | | |
| Start Date 8/06 | Ending Date 6/07 | a. Applicant 4th | | b. Project 4th |
| 15. ESTIMATED FUNDING: | | 16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS? | | |
| a. Federal | \$ 122,893.58. ⁰⁰ | a. YES. <input type="checkbox"/> THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE : _____ | | |
| b. Applicant | \$ 18,272.71. ⁰⁰ | b. NO. <input checked="" type="checkbox"/> PROGRAM IS NOT COVERED BY E.O. 12372 | | |
| c. State | \$. ⁰⁰ | <input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW | | |
| d. Local | \$. ⁰⁰ | | | |
| e. Other | \$. ⁰⁰ | | | |
| f. Program Income | \$. ⁰⁰ | 17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT? | | |
| g. TOTAL | \$ 141,166.29. ⁰⁰ | <input type="checkbox"/> Yes, If "Yes", attach an explanation <input checked="" type="checkbox"/> No | | |
| 18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED. | | | | |
| a. Authorized Representative | | | | |
| Prefix Mr. | | First Name: Carlos | | Middle Name: |
| Last Name: Mayans | | | | Suffix: |
| b. Title: President | | c. Telephone: 316-268-4331 | | |
| d. Signature of Authorized Representative: | | e. Date Signed: | | |

PART II
PROJECT APPROVAL INFORMATION

Item 1.

Does this assistance request require State, local, regional, or other priority rating?

Yes ☒ NoName of Governing Body:
Priority:**Item 2.**

Does this assistance request require State, or local advisory, educational or health clearances?

Yes ☒ NoName of Agency or Board:
(Attach Documentation)**Item 3.**

Does this assistance request require clearinghouse review in accordance with OMB Circular A-95?

Yes ☒ No

(Attach Comments)

Item 4.

Does this assistance request require State, local, regional or other planning approval?

Yes ☒ No

Name of Approving Agency:

Date: / /

Item 5.

Is the proposed project covered by an approved comprehensive plan?

Yes ☒ NoCheck one: State
Local
Regional

Location of Plan:

Item 6.

Will the assistance requested serve a Federal installation?

Yes ☒ No

Name of Federal Installation:

Federal Population benefiting from Project:

Item 7.

Will the assistance requested be on Federal land or installation?

Yes ☒ No

Name of Federal Installation:

Location of Federal Land:

Percent of Project:

Item 8.

Will the assistance requested have an impact or effect on the environment?

Yes ☒ No

See instruction for additional information to be provided

Item 9.

Will the assistance requested cause the displacement of individuals, families, businesses, or farms?

Yes ☒ No

Number of:

Individuals: _____

Families: _____

Businesses: _____

Farms: _____

Item 10.

Is there other related Federal assistance on this project previous, pending, or anticipated?

Yes ☒ No

See instructions for additional information to be provided.

PART III - BUDGET INFORMATION

SECTION A - BUDGET SUMMARY

| Grant Program, Function Or Activity (a) | Federal Catalog No. (b) | Estimated Unobligated Funds | | New or Revised Budget | | |
|--|-------------------------------|-----------------------------|--------------------|-----------------------|--------------------|---------------|
| | | Federal (c) | Non-Federal (d) | Federal (e) | Non-Federal (f) | Total (g) |
| 1. AIP | 20-106 | \$ NA | \$ NA | \$ 122,893.58 | \$ 18,272.71 | \$ 141,166.29 |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. TOTALS | | \$ | \$ | \$ 122,893.58 | \$ 18,272.71 | \$ 141,166.29 |

SECTION B - BUDGET CATEGORIES

| 6. Object Class Categories | Grant Program, Function or Activity | | | | Total |
|----------------------------|-------------------------------------|-----|-----|-----|-------|
| | (1) | (2) | (3) | (4) | (5) |
| a. Personnel | \$ | \$ | \$ | \$ | \$ |
| b. Fringe Benefits | | | | | |
| c. Travel | | | | | |
| d. Equipment | | | | | |
| e. Supplies | | | | | |
| f. Contractual | | | | | |
| g. Construction | | | | | |
| h. Other | | | | | |
| i. Total Direct Charges | | | | | |
| j. Indirect Charges | | | | | |
| k. TOTALS | \$ | \$ | \$ | \$ | \$ |
| l. Program Income | \$ | \$ | \$ | \$ | \$ |

SECTION C - NON-FEDERAL RESOURCES

| (a) GRANT PROGRAM | (b) APPLICANT | (c) STATE | (d) OTHER SOURCES | (e) TOTALS |
|-------------------|---------------|-----------|-------------------|--------------|
| 8. AIP | \$ 18,272.71 | \$ NA | \$ NA | \$ 18,272.71 |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 12. TOTALS | \$ 18,272.71 | \$ | \$ | \$ 18,272.71 |

SECTION D - FORECASTED CASH NEEDS

| | Total for 1 st Year | 1 st Quarter | 2 nd Quarter | 3 rd Quarter | 4 th Quarter |
|-----------------|--------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 13. Federal | \$ | \$ | \$ | \$ | \$ |
| 14. Non-Federal | | | | | |
| 15. TOTAL | \$ | \$ | \$ | \$ | \$ |

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

| (a) GRANT PROGRAM | FUTURE FUNDING PERIODS (YEARS) | | | |
|-------------------|--------------------------------|------------|-----------|------------|
| | (b) FIRST | (c) SECOND | (d) THIRD | (e) FOURTH |
| 16. | \$ | \$ | \$ | \$ |
| 17. | | | | |
| 18. | | | | |
| 19. | | | | |
| 20. TOTALS | \$ | \$ | \$ | \$ |

SECTION F - OTHER BUDGET INFORMATION

(Attach additional sheets if necessary)

21 Direct Charges:

22. Indirect Charges:

23. Remarks:

SUMMARY OF EXPENSES

| | Amount | Eligible | Ineligible |
|------------------------------|---------------|------------|------------|
| Applied Pavement Technology: | | | |
| Wichita Mid-Continent | \$ 100,088.30 | 92,734.83 | 7,353.47 |
| Colonel James Jabara | 34,077.99 | 31,626.83 | 2,451.16 |
| Photo Framing | 2,000.00 | | 2,000.00 |
| Administration | 5,000.00 | 5,000.00 | |
| TOTAL | 141,166.29 | 129,361.66 | 11,804.63 |

PART IV
PROGRAM NARRATIVE
(Suggested Format)

DEPARTMENT OF TRANSPORTATION - FEDERAL AVIATION ADMINISTRATION

OMB NO. 2120-0569

PROJECT : Pavement Condition Inventory

AIRPORT : Wichita Mid-Continent and Colonel James Jabara

1. Objective:

Perform pavement condition inventory as a component of the Sponsor's airfield pavement maintenance management program.

2. Benefits Anticipated:

Documentation of priorities to focus Sponsor's maintenance and replacement funds.

3. Approach : (See approved Scope of Work in Final Application)

See attached scope of services.

4. Geographic Location:

Wichita, Kansas (see attached map)

5. If Applicable, Provide Additional Information:

N/A

6. Sponsor's Representative: (include address & telephone number)

John Oswald, P. E.
2173 Air Cargo Road
Wichita, Kansas 67209
316-946-4715

WICHITA AIRPORT AUTHORITY AIRFIELD PAVEMENT CONDITION INVENTORY UPDATE SCOPE OF SERVICES

Applied Pavement Technology, Inc. (APTech) has teamed with HNTB Corporation (HNTB), Martinez Corporation (Martinez), and Geotechnical Services, Inc. (GSI) to perform a pavement condition inventory update at Mid-Continent and Colonel James Jabara Airports for the Wichita Airport Authority. This document outlines the Scope of Services and deliverables to be provided under this project.

Task 1. Systems Inventory

1a. Kick-Off Meeting

The project will begin with a kick-off meeting with the Wichita Airport Authority at the Authority's office. During this meeting, the final scope of work and schedule will be reviewed. Each deliverable will be discussed in detail, so that everyone leaves the meeting with a clear understanding of the schedule and final products expected from this project. In particular, coordination and timing of the field work activities—including PCI surveys, FWD testing, and geotechnical work—will be discussed, and the timing and format for the aerial photography will be finalized.

The quality control procedures to be followed throughout the project will also be presented and discussed, as well as airport access and other security and airport operation issues. During this meeting, a project contact list will be generated and the chain of communication to be used throughout the project will be established. As with all meetings, APTech will take minutes and deliver a formal copy to the Authority's Project Manager for approval within 1 week of the meeting. The systems inventory task will begin in conjunction with this meeting.

1b. Work History

Pavement construction, rehabilitation, and maintenance history information will be collected for both Mid-Continent and Colonel James Jabara Airports. Much of the construction history information is included in the previous airport pavement management system (APMS) reports. Thus, the efforts on this project will focus on any maintenance and rehabilitation work that has been performed since 2003 (such as the reconstruction of Taxiway A at Mid-Continent Airport).

Prior to finalizing the systems inventory information, the APTech Team will provide the Authority with a draft summary of the collected information (from both Mid-Continent and Colonel James Jabara Airports) for review and comment. The data will then be preserved in the existing Micro PAVER pavement management databases for each airport.

1c. Traffic

Traffic information will be gathered for both airports. Required aircraft traffic data include the aircraft type, landing gear configurations, maximum take-off weights (MTOW), number of annual departures and arrivals, anticipated changes in annual departures and arrivals, and aircraft taxiing patterns. Aircraft traffic data will be compiled for both arrivals and departures of the most critical aircraft.

The traffic data from the previous APMS and Taxiway A projects will serve as a starting point; traffic information in the latest Airport Master Plan will also be evaluated. However, it is important that existing traffic data be evaluated to ensure that it accurately portrays current and future traffic mixes and patterns. AP Tech will work closely with the Wichita Airport Authority to identify traffic patterns, design aircraft, and other information.

Deliverables

The following deliverables will be submitted as part of this task:

- Minutes of project kick-off meeting.
- Project contact list.
- Summary of work history records for each pavement section (both airports).
- Summary of aircraft traffic mix (both airports) for approval.

Task 2. Network Definition

Based on the work history findings, the pavement network at both Mid-Continent and Colonel James Jabara Airports will be divided into facilities (branches), features (sections), and sample units in accordance with FAA and ASTM guidelines. The information from the 2003 APMS project will be used as a starting point for defining the network; it will be updated based on the work history information collected under Task 1.

Deliverables

There are no deliverables planned as part of this task:

Task 3. Mapping

All branch, section, and sample unit boundaries will be shown on the airport network definition map. Upon completion of the pavement condition survey task, the network definition map will be modified to reflect any changes identified in the field. A work history map will also be prepared that shows the construction and rehabilitation history of each pavement section.

Upon completion of the pavement inspection, a color-coded Pavement Condition Index (PCI) map will be prepared. In addition, a map will be developed that identifies the prioritized list of projects recommended in the Capital Improvement Program (CIP). Maps will also be prepared showing the PCI of each section with and without the recommended maintenance and

rehabilitation projects, which provides a quick comparison of the effect of the proposed funding level.

During the pavement inspections, global positioning system (GPS) coordinates will be obtained such that all maps will be developed using the Kansas State Plane Coordinate System. Whenever possible, the aerial photographs will be used to display the project findings and recommendations.

Deliverables

The following maps will be submitted as part of this task:

- Network definition map.
- Work history map.
- 2006 PCI map.
- FWD testing locations.
- 10-year CIP.
- Projected 2016 PCI following CIP.
- Projected 2016 PCI without any rehabilitation work.

Maps will be submitted for both Mid-Continent and Colonel James Jabara Airports in both electronic format and in hard copy format within the draft and final reports.

Task 4. Aerial Photography

Martinez Corporation will produce geo-referenced rectified raster images and hard copy deliverables for Mid-Continent and Colonel James Jabara Airports. The geo-referenced images will be created using new color photography and ground control data suitable to produce deliverables at a 1" = 100' horizontal scale; the hard copy deliverables will be created using higher level photography. The work on this task will follow the sequence outlined below:

- *Ground Control.* The ground control data shall be established to the NAD83/NAVD88 datum (or preferred coordinate system) and shall be executed by means of ground targets and Airborne GPS. The aerial photography will be geo-referenced using a combination of Airborne GPS (continuously operating receiving station) supplemented with existing ground control points.
- *Aerial Photography.* Two flight altitudes will be used to capture images. The first will be a mid-level flight altitude to create 6-inch pixel resolution orthophotography. Color oblique photographs and higher altitude photography will also be captured for creating the hard-copy deliverables.
- *Data Processing.* The new aerial photography will be reviewed for proper tone and balance and will be digitally scanned on a precision photogrammetric scanner at a resolution of 14 microns. This resolution will produce a 6-inch ground pixel and will be suitable for digital orthophotography production. The scanned images will be exported to a workstation and the aero-triangulation process will be completed. This process will orient individual stereo pairs along with the ground surveyed control coordinates.

- *Digital Orthophotos.* Utilizing the scanned imagery, a digital elevation model will be produced to cover the project area. This digital elevation model will be used to support the orthophoto rectification. The final rectified imagery will hold a ground pixel resolution of 6 inches, suitable for a 1"=100' scale, and will be reviewed to ensure that seams are not visible and images have tonal uniformity.
- *Hard-Copy Image Reproduction.* The captured photography for the production of hard-copy deliverables will be digitally scanned and submitted for the selection of preferred images.

Deliverables

The following deliverables for Mid-Continent Airport will be submitted as part of this task:

- Color digital orthophoto mosaic delivered on CD-ROM in a TIFF format with TFW World files, *.dgn and *.dwg files included for geo-referencing the digital image.
- Digital image of preferred oblique image in a TIFF format (or other preferred digital format).
- Fifteen (15) 45" x 45", 1" = 500' scale color prints.
- Six (6) 20" x 20", 1" = 1000' scale color prints.
- Four (4) 45" x 45" color oblique prints.
- Four (4) 20" x 20" color oblique prints.
- Two (2) 24" x 36", 1" = 600' scale black-and-white photo film positives.

Likewise, the following deliverables for Colonel James Jabara Airport will be submitted as part of this task:

- Color digital orthophoto mosaic delivered on CD-ROM in a TIFF format with TFW World files, *.dgn and *.dwg files included for geo-referencing the digital image.
- Digital image of preferred oblique image in a TIFF format (or other preferred digital format).
- Eleven (11) 45" x 45", 1" = 400' scale color prints.
- Six (6) 20" x 20", 1" = 800' scale color prints.
- Four (4) 45" x 45" color oblique prints.
- Four (4) 20" x 20" color oblique prints.
- Two (2) 24" x 36", 1" = 400' scale black-and-white photo film positives.

Task 5. Pavement Evaluation

The pavements at Mid-Continent and Colonel James Jabara Airports will be evaluated through a visual pavement condition survey to assess the pavement's surface condition. Selected pavement sections at Mid-Continent Airport will undergo further non-destructive testing using a heavy-weight model FWD to assess the pavement's structural integrity.

5a. Visual Pavement Condition Evaluation

During the visual condition assessment, the pavements at Mid-Continent and Colonel James Jabara Airports will be inspected using the PCI procedure as described in FAA AC 150/5380-6A and ASTM Standards D5340 and D6433. During the PCI survey, visible signs of deterioration within a selected sample unit will be recorded and analyzed by distress type, severity, and quantity.

While the PCI results give a general indication of the overall pavement condition, the specific maintenance and rehabilitation needs of a pavement may be obscured by such an index.








Therefore, during the PCI inspection the APTech Team will also identify the specific distresses that are present, report on the possible causes of such distresses, and relate such findings to general categories of treatment. In addition, an extensive photographic log and inspectors' field comments will be maintained. Of course, during the survey if any area is found that might present a current hazard to aircraft operations, the Authority will be notified immediately.

Since the development of pavement repair programs within a 10-year CIP is based on the condition data collected during the project, it is very important that the Wichita Airport Authority have a thorough understanding of how pavement condition data are collected and what that information means. Therefore, Airport personnel will be encouraged to accompany the field crew during the pavement inspection. Since APTech uses an experienced pavement engineer to lead the field team (not a technician or an engineer without airport PCI experience), team members are able to provide solid training to airport staff and to advise them on the cause(s) of distresses present at their airport and the different maintenance and rehabilitation actions that can be taken to correct them.

Prior to conducting the PCI surveys, a field schedule will be developed to ensure timeliness of the data collection efforts. All field work will be scheduled in coordination with the Wichita Airport Authority. Critical operation areas where access may be limited will be identified and scheduled during slower traffic periods to maximize the efficiency of inspection and to minimize the impact on airfield operations. It is assumed that all inspections will be conducted during daylight hours.

The inspection team will use pen-based handheld computers to directly enter distress data into Micro PAVER during the PCI inspection. The use of these computers significantly accelerates the processing of the collected data and also increases data accuracy because of the built-in error-checking

PAVEMENT CONDITION INDEX

| | |
|--|---------------------|
|  | 86-100, Good |
|  | 71-85, Satisfactory |
|  | 56-70, Fair |
|  | 41-55, Poor |
|  | 26-40, Very Poor |
|  | 11-25, Serious |
|  | 0-10, Failed |



capabilities. One further advantage of using this technology is that processed PCI data become immediately available upon completion of the pavement inspection.

5b. Structural Pavement Assessment

Nondestructive testing will be performed on selected pavement sections at Mid-Continent Airport to determine the structural integrity and load-carrying capacity of the pavement sections. This testing will be conducted using APTech's Dynatest Model 8082 heavy-weight FWD, which is capable of simulating aircraft wheel loadings up to 55,000 pounds. FWD testing and analysis will be performed in accordance with FAA AC 150/5370-11A, *Use of Nondestructive Testing in the Evaluation of Airport Pavements*.

APTech will perform 3 days of FWD testing at Wichita Mid-Continent Airport, which will include a minimum of 450 test locations. Rather than pre-select the sections, APTech will identify the pavement sections on which to perform FWD testing during the PCI surveys, which will allow a better assessment of the sections that require structural testing. Priority will be given to those sections that may require rehabilitation within the next 3 to 5 years, which will help determine the most appropriate rehabilitation option for such sections. A list of the proposed sections identified for FWD testing will be presented to the Wichita Airport Authority for approval prior to testing.

The FWD equipment is configured for each project to address local conditions. The purpose of the customized configuration is to simulate the actual loading conditions in the field. Given the aircraft operating at Mid-Continent Airport, the following configuration is envisioned:

- Three-drop test sequence of approximately 20,000, 30,000, and 40,000 lbs.
- Large load plate with an 8.86-in radius.
- Sensors spaced at 0, 12, 24, 36, 48, 60, and 72 inches.

However, the testing configuration may be modified based on a review of the traffic information and discussions with the Wichita Airport Authority.

All testing work will be scheduled in coordination with the Wichita Airport Authority. Critical operation areas where access may be limited will be identified and scheduled for inspection during slower traffic periods to maximize the efficiency of inspection and to minimize the impact on airfield operations.

Deliverables

The following deliverables will be submitted as part of this task:

- Schedule for PCI surveys.
- Photographs of distresses with GPS coordinates.
- FWD testing plan (to be approved by WAA).
- One (1) Trimble Geo XT GPS unit.

Task 6. Geotechnical Services

Obtaining accurate cross sections through pavement coring offers the following benefits:

- Provide data for sections with missing construction history information.
- Produce more accurate backcalculation results (pavement layer and subgrade moduli), which are extremely sensitive to pavement thickness.
- Develop the most appropriate rehabilitation option and proper timing.
- Determine specific overlay thicknesses and pavement cross sections.
- More precisely estimate future funding needs.

Core data are available for some sections from previous construction projects and can be used to meet the needs of this project; the Wichita Airport Authority will provide this information. However, some additional coring will be very beneficial, especially on the general aviation aprons at Mid-Continent Airport that are expected to be rehabilitated or reconstructed in the near future. APTech will create and submit a coring plan to the Wichita Airport Authority based on an initial review of available construction history and previous coring information and a visual assessment of the pavements. It is assumed that 20 cores will be retrieved at Mid-Continent Airport as part of this project, with the majority of the cores retrieved on the general aviation aprons. The coring information collected during this task, including past records, will be summarized in an appendix of the report.

Deliverables

The following deliverables will be submitted as part of this task:

- Geotechnical testing plan (to be approved by WAA).
- Appendix summarizing coring results, including information collected during this project and information gathered from previous project records.

Task 7. Micro PAVER Database Update

During this task, the information collected during this study will be entered into the existing Micro PAVER pavement management databases for Mid-Continent and Colonel James Jabara Airports. Both databases will undergo a thorough quality control and assurance process to ensure that information stored in the Micro PAVER database is accurate and consistent with the information collected throughout the project.

Deliverables

The following deliverables will be submitted as part of this task:

- Updated Micro PAVER database for Mid-Continent Airport.
- Updated Micro PAVER database for Colonel James Jabara Airport.

Task 8. Micro PAVER Customization

During this task, APTech will customize the inputs that feed into the Micro PAVER pavement management database to more accurately reflect the conditions and policies under which Mid-Continent and Colonel James Jabara Airports operate (i.e., that inputs will be modified but not the program itself). This information will likely be quite different for the two airports.

The customization process will include developing pavement performance models, establishing prioritization guidelines, developing maintenance and rehabilitation policies, and entering unit cost information for maintenance and rehabilitation actions. This information will be specific to each airport, which will permit the Wichita Airport Authority to use the program to perform realistic analyses and generate realistic capital budgeting outputs. APTech will attend a meeting with the Wichita Airport Authority to discuss these customization options.

8a. Performance Model Development

Pavement management involves forecasting needs based on pavement performance predictions. By projecting the rate at which the conditions will change over time, a meaningful economic analysis can be performed to compare the cost of preventive maintenance versus rehabilitation activities. In addition to identifying the most economical type of repair, the optimal time for applying treatments can be estimated. Typically, the optimal repair time is the point at which a gradual rate of deterioration begins to increase to a much faster rate. It is critical to identify this point to avoid higher maintenance and rehabilitation costs caused by excess deterioration.

Many methods for predicting pavement condition are available. Micro PAVER predicts the condition using an advanced modeling technique that involves organizing the pavement network into "families" of pavements that perform in a similar manner. For example, PCC runway pavement sections that have never received an overlay and are subjected to heavy traffic may be grouped into a family. A constrained regression (set to the degree that the user feels is appropriate) is then applied to the data set (pavement age versus PCI value) to develop a deterioration curve for that family of pavements. The performance of an individual section can then be predicted using a section's relative position to the family curve that represents it.

At a minimum, it is anticipated that the following factors will be assessed to determine their impact on the performance of the investigated pavements: pavement surface type, pavement use (runway, taxiway, and apron), type of traffic, and volume of traffic. Separate models will be developed for each airport.

8b. Prioritization Guidelines

Prioritization guidelines within Micro PAVER are used to rank major rehabilitation projects according to the practices of the user when there is not enough funding for all identified projects. Guidelines can be established based on such factors as pavement use (runway, taxiway, or apron) and section rank. APTech will work closely with the Wichita Airport Authority to establish the prioritization guidelines for Mid-Continent and Colonel James Jabara Airports.

8c. Maintenance Policies

Micro PAVER permits the user to define three types of maintenance policies for each surface type: stop-gap, localized preventive, and global preventive. Stop-gap maintenance policies are applied when major rehabilitation is warranted but not funded. In this case, maintenance actions are limited to those sections where there is a potential safety issue (such as wide cracks or distresses creating possible FOD or hydroplaning situations). Localized preventive maintenance policies are applied to pavements that are in good condition and where preventive maintenance actions (such as crack sealing and joint sealing) have good potential to slow the rate of pavement deterioration. Global preventive maintenance policies are also applied to pavements in good condition; however, they are applied over an entire section area rather than to an individual distress. For example, surface treatments are considered a global preventive maintenance action.

During the customization process, the stop-gap, localized preventive, and global preventive maintenance policies will be established for Mid-Continent and Colonel James Jabara Airports. Each policy will contain the maintenance activity and cost considered applicable for repairing each distress type, amount, and severity. This information will be used in Micro PAVER during the development of maintenance plans.

8d. Unit Cost Information

The unit cost appropriate for the repair of different pavement types at different PCI levels will be entered for Mid-Continent and Colonel James Jabara Airports. This information is used in Micro PAVER during the development of the CIP. Furthermore, the unit cost information for typical maintenance actions (such as patching, crack sealing, joint sealing, surface treatments, and so on) will be entered. It is assumed that the Wichita Airport Authority will provide previous bid documents or other information that can be used to determine local unit costs.

Deliverables

The following deliverables will be submitted as part of this task:

- Customization document for Mid-Continent Airport.
- Customization document for Colonel James Jabara Airport.

Task 9. Data Analysis

9a. Visual Data Analysis

Micro PAVER will be used to analyze the PCI data. Three aspects of the data will be analyzed for each section at both Mid-Continent and Colonel James Jabara Airports: composite index, cause of deterioration, and rate of deterioration. This information will then be used to estimate the remaining life of each pavement section. These terms are defined below:

- *Composite Index.* The PCI for each section will be calculated. The PCI provides a general sense of the pavement condition and the magnitude of work required to rehabilitate the pavement.

- *Cause of Deterioration.* The types of distress identified during the surveys will also be analyzed, which also provides insight into the cause of pavement deterioration. Distress types are characterized as load-related (such as corner breaks or mid-panel cracks), climate-related (such as weathering and raveling), and materials-related (such as durability cracking). Understanding the cause of distress allows a treatment to be selected that corrects the cause of deterioration, thus preventing its recurrence.
- *Pavement Deterioration Rate.* The deterioration rate helps identify those pavement sections that are failing faster than normal. Sections exhibiting higher than normal deterioration rates warrant close monitoring and further evaluation.
- *Remaining Life.* One method for estimating remaining life is to examine the pavement performance in terms of PCI. This determination will be made using the performance models developed from the Airport's PCI data.

9b. Structural Data Analysis

One of the primary benefits of FWD testing is the ability to use the results to determine the structural condition of the pavement layers and the support of the underlying subgrade. This information, combined with projected traffic loadings, will then be used to estimate the allowable loads and to determine the remaining structural life of each pavement section. FWD testing will be performed on select pavement sections at Mid-Continent Airport only, as outlined in Task 5. APTech will use the FWD data to evaluate the following pavement properties (only for those pavement sections in which FWD testing is performed):

- *Normalized Deflections.* Deflection profiles will be plotted to illustrate the maximum deflections (normalized to a standard load and temperature) against the stationing along the facility. Areas with changes in pavement structural capacity or current condition will be evident from the longitudinal deflection profiles.
- *Layer Modulus Values.* Elastic moduli (E) for each pavement layer and subgrade support values—modulus of subgrade reaction (k) for rigid pavements and resilient modulus for flexible pavements—will be determined from backcalculation. APTech will apply appropriate analysis procedures based on the type of pavement being tested.
- *Joint Load Transfer.* Joint load transfer efficiencies (LTE) will be calculated on PCC pavement sections by loading the pavement at selected joints, and measuring the deflections on the loaded and unloaded side of the joint. The ratio of the unloaded to loaded deflections is the load transfer efficiency, which relates directly to the load carrying capacity of the pavement.
- *Allowable Loads.* Two approaches will be used to determine the allowable load limits of each pavement section. First, the critical pavement strains and stresses will be used to determine the allowable gross aircraft weight for a specified number of load applications using a mechanistic-empirical approach. Secondly, the allowable gross aircraft weight will be determined using the FAA design procedure outlined in AC 150/5320-6D. The

result will be a table showing the allowable load limits for each configuration (single, dual, and dual tandem).

- *Structural Remaining Life.* A mechanistic-empirical approach will be used to determine the time (in years) until each pavement section reaches the end of its life as defined by an acceptable level of deterioration (cracking on PCC pavements, and rutting or alligator cracking on AC pavements).

In addition, the results will be used to develop rehabilitation designs for those sections included in the 10-year CIP.

Deliverables

There are no deliverables planned as part of this task. The results of this task will be included in the project report (Task 12).

Task 10. 10-Year Capital Improvement Program

All of the information compiled during the previous tasks will be used to develop a 10-year CIP outlining the maintenance and rehabilitation activities recommended for Mid-Continent and Colonel James Jabara Airports. Prior to developing this program, APTech will work with the Wichita Airport Authority to identify the parameters controlling this program (annual budget, inflation rate, and so on). With the incorporation of FWD testing, a more accurate assessment of the pavement's future structural needs will be determined, which will allow for the development of specific rehabilitation designs and realistic cost estimates.

Upon completion of a preliminary plan, the APTech Team will meet with Authority staff to discuss the plan and to provide modifications to take into account other factors, such as safety requirements, operational concerns, construction feasibility, or projects that are already committed to a given year. By considering these factors, the final program will be a much more realistic reflection of what the Wichita Airport Authority plans to accomplish in the future.

Deliverables

There are no deliverables planned for this task. The CIP map will be delivered as part of Task 3, and the CIP recommendations will be presented in the project report (Task 12).

Task 11. PCI Training

Training in the airfield PCI procedure and distress identification is a two-step process. The first step consists of a classroom course using color photographs of pavement distresses. This ½-day course will be conducted immediately prior to the PCI inspections. The second step in the training process is field training. During at least one day of the actual inspection, Wichita Airport Authority staff being trained in the PCI procedure will accompany the inspection team. As part of this training process, APTech will also provide the Authority with its interactive training CD on the airfield PCI procedure. This CD will provide the staff with an excellent

resource during training of future pavement inspectors and is also a readily accessible tool to facilitate refresher training.

Deliverables

The following deliverables will be submitted as part of this task:

- PCI training manual (copy of slide presentation and ASTM specification).
- Interactive training CD.

Task 12. Report Generation

12a. Project Report

A detailed report will be prepared that provides comprehensive information on the work undertaken, the data collected, and the results of all analyses. The report will also contain a discussion on the future use and update of the APMS. The electronic version of the report will contain hyper-text linking with the table of contents, figures, tables, acronyms, glossary, and references to other parts of the report. A draft version of the report will be submitted to the Wichita Airport Authority for review. The report will then be revised to incorporate the Authority's comments, and a final report will be submitted. Separate reports will be submitted for Mid-Continent and Colonel James Jabara Airports.

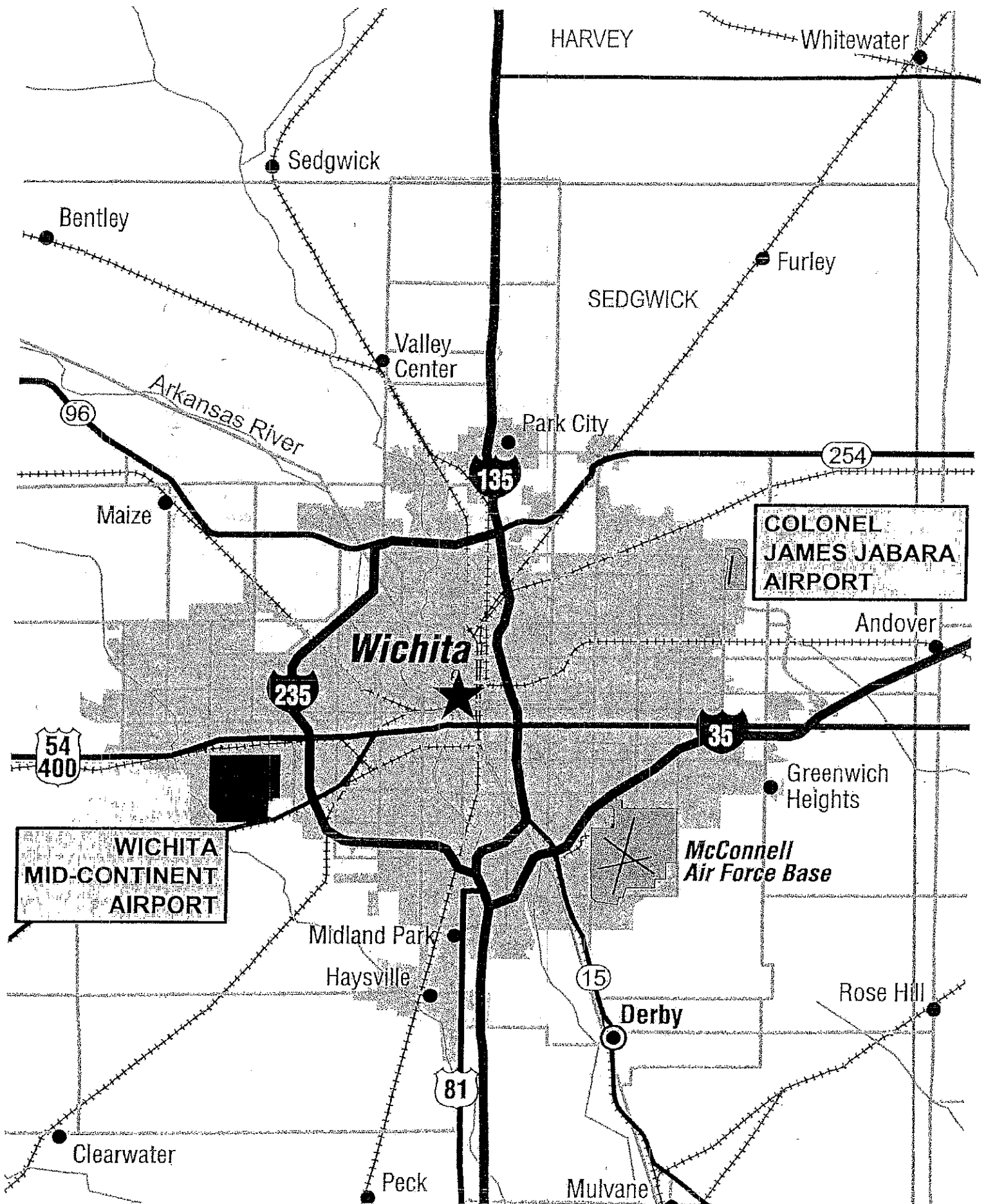
12b. Executive Summary

An *Executive Summary*, highlighting the key findings and recommendations of the study, will also be prepared. This report will be an 8- to 10-page stand-alone document prepared on glossy paper using full color. It will document the needs of the airport pavement infrastructure in non-technical, but persuasive, terms.

Deliverables

The following deliverables will be submitted as part of this task:

- Memo summarizing results for General Aviation Apron.
- Two (2) copies of draft project for Mid-Continent Airport.
- Five (5) copies of final project report for Mid-Continent Airport.
- Five (5) copies of draft Executive Summary for Mid-Continent Airport.
- Twenty-five (25) copies of final *Executive Summary* for Mid-Continent Airport.
- Two (2) copies of draft project for Colonel James Jabara Airport.
- Five (5) copies of final project report for Colonel James Jabara Airport.
- Five (5) copies of draft Executive Summary for Colonel James Jabara Airport.
- Twenty-five (25) copies of final *Executive Summary* for Colonel James Jabara Airport.



ASSURANCES
Airport Sponsors

A. General.

1. These assurances shall be complied with in the performance of grant agreements for airport development, airport planning, and noise compatibility program grants for airport sponsors.
2. These assurances are required to be submitted as part of the project application by sponsors requesting funds under the provisions of Title 49, U.S.C., subtitle VII, as amended. As used herein, the term "public agency sponsor" means a public agency with control of a public-use airport; the term "private sponsor" means a private owner of a public-use airport; and the term "sponsor" includes both public agency sponsors and private sponsors.
3. Upon acceptance of the grant offer by the sponsor, these assurances are incorporated in and become part of the grant agreement.

B. Duration and Applicability.

1. **Airport development or Noise Compatibility Program Projects Undertaken by a Public Agency Sponsor.** The terms, conditions and assurances of the grant agreement shall remain in full force and effect throughout the useful life of the facilities developed or equipment acquired for an airport development or noise compatibility program project, or throughout the useful life of the project items installed within a facility under a noise compatibility program project, but in any event not to exceed twenty (20) years from the date of acceptance of a grant offer of Federal funds for the project. However, there shall be no limit on the duration of the assurances regarding Exclusive Rights and Airport Revenue so long as the airport is used as an airport. There shall be no limit on the duration of the terms, conditions, and assurances with respect to real property acquired with federal funds. Furthermore, the duration of the Civil Rights assurance shall be specified in the assurances.
2. **Airport Development or Noise Compatibility Projects Undertaken by a Private Sponsor.** The preceding paragraph 1 also applies to a private sponsor except that the useful life of project items installed within a facility or the useful life of the facilities developed or equipment acquired under an airport development or noise compatibility program project shall be no less than ten (10) years from the date of acceptance of Federal aid for the project.
3. **Airport Planning Undertaken by a Sponsor.** Unless otherwise specified in the grant agreement, only Assurances 1, 2, 3, 5, 6, 13, 18, 30, 32, 33, and 34 in section C apply to planning projects. The terms, conditions, and assurances of the grant agreement shall remain in full force and effect during the life of the project.

C. Sponsor Certification. The sponsor hereby assures and certifies, with respect to this grant that:

1. **General Federal Requirements.** It will comply with all applicable Federal laws, regulations, executive orders, policies, guidelines, and requirements as they relate to the application, acceptance and use of Federal funds for this project including but not limited to the following:

Federal Legislation

- a. Title 49, U.S.C., subtitle VII, as amended.
- b. Davis-Bacon Act - 40 U.S.C. 276(a), et seq.¹
- c. Federal Fair Labor Standards Act - 29 U.S.C. 201, et seq.
- d. Hatch Act - 5 U.S.C. 1501, et seq.²

- e. Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C. 4601, et seq.^{1 2}
- f. National Historic Preservation Act of 1966 - Section 106 - 16 U.S.C. 470(f).¹
- g. Archeological and Historic Preservation Act of 1974 - 16 U.S.C. 469 through 469c.¹
- h. Native Americans Grave Repatriation Act - 25 U.S.C. Section 3001, et seq.
- i. Clean Air Act, P.L. 90-148, as amended.
- j. Coastal Zone Management Act, P.L. 93-205, as amended.
- k. Flood Disaster Protection Act of 1973 - Section 102(a) - 42 U.S.C. 4012a.¹
- l. Title 49, U.S.C., Section 303, (formerly known as Section 4(f))
- m. Rehabilitation Act of 1973 - 29 U.S.C. 794.
- n. Civil Rights Act of 1964 - Title VI - 42 U.S.C. 2000d through d-4.
- o. Age Discrimination Act of 1975 - 42 U.S.C. 6101, et seq.
- p. American Indian Religious Freedom Act, P.L. 95-341, as amended.
- q. Architectural Barriers Act of 1968 - 42 U.S.C. 4151, et seq.¹
- r. Power plant and Industrial Fuel Use Act of 1978 - Section 403- 2 U.S.C. 8373.¹
- s. Contract Work Hours and Safety Standards Act - 40 U.S.C. 327, et seq.¹
- t. Copeland Anti kickback Act - 18 U.S.C. 874.¹
- u. National Environmental Policy Act of 1969 - 42 U.S.C. 4321, et seq.¹
- v. Wild and Scenic Rivers Act, P.L. 90-542, as amended.
- w. Single Audit Act of 1984 - 31 U.S.C. 7501, et seq.²
- x. Drug-Free Workplace Act of 1988 - 41 U.S.C. 702 through 706.

Executive Orders

Executive Order 11246 - Equal Employment Opportunity¹
 Executive Order 11990 - Protection of Wetlands
 Executive Order 11988 - Flood Plain Management
 Executive Order 12372 - Intergovernmental Review of Federal Programs.
 Executive Order 12699 - Seismic Safety of Federal and Federally Assisted New Building Construction¹
 Executive Order 12898 - Environmental Justice

Federal Regulations

- a. 14 CFR Part 13 - Investigative and Enforcement Procedures.
- b. 14 CFR Part 16 - Rules of Practice For Federally Assisted Airport Enforcement Proceedings.
- c. 14 CFR Part 150 - Airport noise compatibility planning.
- d. 29 CFR Part 1 - Procedures for predetermination of wage rates.¹
- e. 29 CFR Part 3 - Contractors and subcontractors on public building or public work financed in whole or part by loans or grants from the United States.¹
- f. 29 CFR Part 5 - Labor standards provisions applicable to contracts covering federally financed and assisted construction (also labor standards provisions applicable to non-construction contracts subject to the Contract Work Hours and Safety Standards Act).¹
- g. 41 CFR Part 60 - Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor (Federal and federally assisted contracting requirements).¹

- h. 49 CFR Part 18 - Uniform administrative requirements for grants and cooperative agreements to state and local governments.³
- i. 49 CFR Part 20 - New restrictions on lobbying.
- j. 49 CFR Part 21 - Nondiscrimination in federally-assisted programs of the Department of Transportation - effectuation of Title VI of the Civil Rights Act of 1964.
- k. 49 CFR Part 23 - Participation by Disadvantage Business Enterprise in Airport Concessions.
- l. 49 CFR Part 24 - Uniform relocation assistance and real property acquisition for Federal and federally assisted programs.^{1,2}
- m. 49 CFR Part 26 - Participation By Disadvantaged Business Enterprises in Department of Transportation Programs.
- n. 49 CFR Part 27 - Nondiscrimination on the basis of handicap in programs and activities receiving or benefiting from Federal financial assistance.¹
- o. 49 CFR Part 29 - Government wide debarment and suspension (non-procurement) and government wide requirements for drug-free workplace (grants).
- p. 49 CFR Part 30 - Denial of public works contracts to suppliers of goods and services of countries that deny procurement market access to U.S. contractors.
- q. 49 CFR Part 41 - Seismic safety of Federal and federally assisted or regulated new building construction.¹

Office of Management and Budget Circulars

- a. A-87 - Cost Principles Applicable to Grants and Contracts with State and Local Governments.
- b. A-133 - Audits of States, Local Governments, and Non-Profit Organizations

¹ These laws do not apply to airport planning sponsors.

² These laws do not apply to private sponsors.

³ 49 CFR Part 18 and OMB Circular A-87 contain requirements for State and Local Governments receiving Federal assistance. Any requirement levied upon State and Local Governments by this regulation and circular shall also be applicable to private sponsors receiving Federal assistance under Title 49, United States Code.

Specific assurances required to be included in grant agreements by any of the above laws, regulations or circulars are incorporated by reference in the grant agreement.

2. Responsibility and Authority of the Sponsor:

- a. **Public Agency Sponsor:** It has legal authority to apply for the grant, and to finance and carry out the proposed project; that a resolution, motion or similar action has been duly adopted or passed as an official act of the applicant's governing body authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.
- b. **Private Sponsor:** It has legal authority to apply for the grant and to finance and carry out the proposed project and comply with all terms, conditions, and assurances of this grant agreement. It shall designate an official representative and shall in writing direct and authorize that person

to file this application, including all understandings and assurances contained therein; to act in connection with this application; and to provide such additional information as may be required.

3. **Sponsor Fund Availability.** It has sufficient funds available for that portion of the project costs which are not to be paid by the United States. It has sufficient funds available to assure operation and maintenance of items funded under the grant agreement which it will own or control.

4. **Good Title.**

- a. It, a public agency or the Federal government, holds good title, satisfactory to the Secretary, to the landing area of the airport or site thereof, or will give assurance satisfactory to the Secretary that good title will be acquired.
- b. For noise compatibility program projects to be carried out on the property of the sponsor, it holds good title satisfactory to the Secretary to that portion of the property upon which Federal funds will be expended or will give assurance to the Secretary that good title will be obtained.

5. **Preserving Rights and Powers.**

- a. It will not take or permit any action which would operate to deprive it of any of the rights and powers necessary to perform any or all of the terms, conditions, and assurances in the grant agreement without the written approval of the Secretary, and will act promptly to acquire, extinguish or modify any outstanding rights or claims of right of others which would interfere with such performance by the sponsor. This shall be done in a manner acceptable to the Secretary.
- b. It will not sell, lease, encumber, or otherwise transfer or dispose of any part of its title or other interests in the property shown on Exhibit A to this application or, for a noise compatibility program project, that portion of the property upon which Federal funds have been expended, for the duration of the terms, conditions, and assurances in the grant agreement without approval by the Secretary. If the transferee is found by the Secretary to be eligible under Title 49, United States Code, to assume the obligations of the grant agreement and to have the power, authority, and financial resources to carry out all such obligations, the sponsor shall insert in the contract or document transferring or disposing of the sponsor's interest, and make binding upon the transferee all of the terms, conditions, and assurances contained in this grant agreement.
- c. For all noise compatibility program projects which are to be carried out by another unit of local government or are on property owned by a unit of local government other than the sponsor, it will enter into an agreement with that government. Except as otherwise specified by the Secretary, that agreement shall obligate that government to the same terms, conditions, and assurances that would be applicable to it if it applied directly to the FAA for a grant to undertake the noise compatibility program project. That agreement and changes thereto must be satisfactory to the Secretary. It will take steps to enforce this agreement against the local government if there is substantial non-compliance with the terms of the agreement.
- d. For noise compatibility program projects to be carried out on privately owned property, it will enter into an agreement with the owner of that

property which includes provisions specified by the Secretary. It will take steps to enforce this agreement against the property owner whenever there is substantial non-compliance with the terms of the agreement.

- e. If the sponsor is a private sponsor, it will take steps satisfactory to the Secretary to ensure that the airport will continue to function as a public-use airport in accordance with these assurances for the duration of these assurances.
 - f. If an arrangement is made for management and operation of the airport by any agency or person other than the sponsor or an employee of the sponsor, the sponsor will reserve sufficient rights and authority to insure that the airport will be operated and maintained in accordance Title 49, United States Code, the regulations and the terms, conditions and assurances in the grant agreement and shall insure that such arrangement also requires compliance therewith.
6. **Consistency with Local Plans.** The project is reasonably consistent with plans (existing at the time of submission of this application) of public agencies that are authorized by the State in which the project is located to plan for the development of the area surrounding the airport.
 7. **Consideration of Local Interest.** It has given fair consideration to the interest of communities in or near where the project may be located.
 8. **Consultation with Users.** In making a decision to undertake any airport development project under Title 49, United States Code, it has undertaken reasonable consultations with affected parties using the airport at which project is proposed.
 9. **Public Hearings.** In projects involving the location of an airport, an airport runway, or a major runway extension, it has afforded the opportunity for public hearings for the purpose of considering the economic, social, and environmental effects of the airport or runway location and its consistency with goals and objectives of such planning as has been carried out by the community and it shall, when requested by the Secretary, submit a copy of the transcript of such hearings to the Secretary. Further, for such projects, it has on its management board either voting representation from the communities where the project is located or has advised the communities that they have the right to petition the Secretary concerning a proposed project.
 10. **Air and Water Quality Standards.** In projects involving airport location, a major runway extension, or runway location it will provide for the Governor of the state in which the project is located to certify in writing to the Secretary that the project will be located, designed, constructed, and operated so as to comply with applicable air and water quality standards. In any case where such standards have not been approved and where applicable air and water quality standards have been promulgated by the Administrator of the Environmental Protection Agency, certification shall be obtained from such Administrator. Notice of certification or refusal to certify shall be provided within sixty days after the project application has been received by the Secretary.
 11. **Pavement Preventive Maintenance.** With respect to a project approved after January 1, 1995, for the replacement or reconstruction of pavement at the airport, it assures or certifies that it has implemented an effective airport pavement maintenance-management program and it assures that it will use such program for the useful life of any pavement constructed, reconstructed or repaired with Federal financial assistance at the airport. It will provide such

reports on pavement condition and pavement management programs as the Secretary determines may be useful.

12. **Terminal Development Prerequisites.** For projects which include terminal development at a public use airport, as defined in Title 49, it has, on the date of submittal of the project grant application, all the safety equipment required for certification of such airport under section 44706 of Title 49, United States Code, and all the security equipment required by rule or regulation, and has provided for access to the passenger enplaning and deplaning area of such airport to passengers enplaning and deplaning from aircraft other than air carrier aircraft.
13. **Accounting System, Audit, and Record Keeping Requirements.**
 - a. It shall keep all project accounts and records which fully disclose the amount and disposition by the recipient of the proceeds of the grant, the total cost of the project in connection with which the grant is given or used, and the amount or nature of that portion of the cost of the project supplied by other sources, and such other financial records pertinent to the project. The accounts and records shall be kept in accordance with an accounting system that will facilitate an effective audit in accordance with the Single Audit Act of 1984.
 - b. It shall make available to the Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, for the purpose of audit and examination, any books, documents, papers, and records of the recipient that are pertinent to the grant. The Secretary may require that an appropriate audit be conducted by a recipient. In any case in which an independent audit is made of the accounts of a sponsor relating to the disposition of the proceeds of a grant or relating to the project in connection with which the grant was given or used, it shall file a certified copy of such audit with the Comptroller General of the United States not later than six (6) months following the close of the fiscal year for which the audit was made.
14. **Minimum Wage Rates.** It shall include, in all contracts in excess of \$2,000 for work on any projects funded under the grant agreement which involve labor, provisions establishing minimum rates of wages, to be predetermined by the Secretary of Labor, in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a-276a-5), which contractors shall pay to skilled and unskilled labor, and such minimum rates shall be stated in the invitation for bids and shall be included in proposals or bids for the work.
15. **Veteran's Preference.** It shall include in all contracts for work on any project funded under the grant agreement which involve labor, such provisions as are necessary to insure that, in the employment of labor (except in executive, administrative, and supervisory positions), preference shall be given to Veterans of the Vietnam era and disabled veterans as defined in Section 47112 of Title 49, United States Code. However, this preference shall apply only where the individuals are available and qualified to perform the work to which the employment relates.
16. **Conformity to Plans and Specifications.** It will execute the project subject to plans, specifications, and schedules approved by the Secretary. Such plans, specifications, and schedules shall be submitted to the Secretary prior to commencement of site preparation, construction, or other performance under this grant agreement, and, upon approval of the Secretary, shall be incorporated into this grant agreement. Any modification to the approved

plans, specifications, and schedules shall also be subject to approval of the Secretary, and incorporated into the grant agreement.

17. **Construction Inspection and Approval.** It will provide and maintain competent technical supervision at the construction site throughout the project to assure that the work conforms to the plans, specifications, and schedules approved by the Secretary for the project. It shall subject the construction work on any project contained in an approved project application to inspection and approval by the Secretary and such work shall be in accordance with regulations and procedures prescribed by the Secretary. Such regulations and procedures shall require such cost and progress reporting by the sponsor or sponsors of such project as the Secretary shall deem necessary.

18. **Planning Projects.** In carrying out planning projects:

- a. It will execute the project in accordance with the approved program narrative contained in the project application or with the modifications similarly approved.
- b. It will furnish the Secretary with such periodic reports as required pertaining to the planning project and planning work activities.
- c. It will include in all published material prepared in connection with the planning project a notice that the material was prepared under a grant provided by the United States;
- d. It will make such material available for examination by the public, and agrees that no material prepared with funds under this project shall be subject to copyright in the United States or any other country.
- e. It will give the Secretary unrestricted authority to publish, disclose, distribute, and otherwise use any of the material prepared in connection with this grant.
- f. It will grant the Secretary the right to disapprove the sponsor's employment of specific consultants and their subcontractors to do all or any part of this project as well as the right to disapprove the proposed scope and cost of professional services.
- g. It will grant the Secretary the right to disapprove the use of the sponsor's employees to do all or any part of the project.
- h. It understands and agrees that the Secretary's approval of this project grant or the Secretary's approval of any planning material developed as part of this grant does not constitute or imply any assurance or commitment on the part of the Secretary to approve any pending or future application for a Federal airport grant.

19. **Operation and Maintenance.**

- a. The airport and all facilities which are necessary to serve the aeronautical users of the airport, other than facilities owned or controlled by the United States, shall be operated at all times in a safe and serviceable condition and in accordance with the minimum standards as may be required or prescribed by applicable Federal, state and local agencies for maintenance and operation. It will not cause or permit any activity or action thereon which would interfere with its use for airport purposes. It will suitably

operate and maintain the airport and all facilities thereon or connected therewith, with due regard to climatic and flood conditions. Any proposal to temporarily close the airport for non-aeronautical purposes must first be approved by the Secretary.

In furtherance of this assurance, the sponsor will have in effect arrangements for-

- (1) Operating the airport's aeronautical facilities whenever required;
- (2) Promptly marking and lighting hazards resulting from airport conditions, including temporary conditions; and
- (3) Promptly notifying airmen of any condition affecting aeronautical use of the airport.

Nothing contained herein shall be construed to require that the airport be operated for aeronautical use during temporary periods when snow, flood or other climatic conditions interfere with such operation and maintenance. Further, nothing herein shall be construed as requiring the maintenance, repair, restoration, or replacement of any structure or facility which is substantially damaged or destroyed due to an act of God or other condition or circumstance beyond the control of the sponsor.

- b. It will suitably operate and maintain noise compatibility program items that it owns or controls upon which Federal funds have been expended.

20. Hazard Removal and Mitigation. It will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport (including established minimum flight altitudes) will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

21. Compatible Land Use. It will take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. In addition, if the project is for noise compatibility program implementation, it will not cause or permit any change in land use, within its jurisdiction, that will reduce its compatibility, with respect to the airport, of the noise compatibility program measures upon which Federal funds have been expended.

22. Economic Nondiscrimination.

- a. It will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.
- b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-
 - (1) furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and
 - (2) charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

- c. Each fixed-based operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed-based operators making the same or similar uses of such airport and utilizing the same or similar facilities.
- d. Each air carrier using such airport shall have the right to service itself or to use any fixed-based operator that is authorized or permitted by the airport to serve any air carrier at such airport.
- e. Each air carrier using such airport (whether as a tenant, non tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non tenants and signatory carriers and non signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.
- f. It will not exercise or grant any right or privilege which operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees [including, but not limited to maintenance, repair, and fueling] that it may choose to perform.
- g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.
- h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport as may be necessary for the safe and efficient operation of the airport.
- i. The sponsor may prohibit or limit any given type, kind or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport or necessary to serve the civil aviation needs of the public.

23. **Exclusive Rights.** It will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed-based operator shall not be construed as an exclusive right if both of the following apply:
- a. It would be unreasonably costly, burdensome, or impractical for more than one fixed-based operator to provide such services, and
 - b. If allowing more than one fixed-based operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed-based operator and such airport.

It further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation, the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations,

aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities which because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

24. Fee and Rental Structure. It will maintain a fee and rental structure for the facilities and services at the airport which will make the airport as self-sustaining as possible under the circumstances existing at the particular airport, taking into account such factors as the volume of traffic and economy of collection. No part of the Federal share of an airport development, airport planning or noise compatibility project for which a grant is made under Title 49, United States Code, the Airport and Airway Improvement Act of 1982, the Federal Airport Act or the Airport and Airway Development Act of 1970 shall be included in the rate basis in establishing fees, rates, and charges for users of that airport.

25. Airport Revenues.

- a. All revenues generated by the airport and any local taxes on aviation fuel established after December 30, 1987, will be expended by it for the capital or operating costs of the airport; the local airport system; or other local facilities which are owned or operated by the owner or operator of the airport and which are directly and substantially related to the actual air transportation of passengers or property; or for noise mitigation purposes on or off the airport. Provided, however, that if covenants or assurances in debt obligations issued before September 3, 1982, by the owner or operator of the airport, or provisions enacted before September 3, 1982, in governing statutes controlling the owner or operator's financing, provide for the use of the revenues from any of the airport owner or operator's facilities, including the airport, to support not only the airport but also the airport owner or operator's general debt obligations or other facilities, then this limitation on the use of all revenues generated by the airport (and, in the case of a public airport, local taxes on aviation fuel) shall not apply.
- b. As part of the annual audit required under the Single Audit Act of 1984, the sponsor will direct that the audit will review, and the resulting audit report will provide an opinion concerning, the use of airport revenue and taxes in paragraph (a), and indicating whether funds paid or transferred to the owner or operator are paid or transferred in a manner consistent with Title 49, United States Code and any other applicable provision of law, including any regulation promulgated by the Secretary or Administrator.
- c. Any civil penalties or other sanctions will be imposed for violation of this assurance in accordance with the provisions of Section 47107 of Title 49, United States Code.

26. Reports and Inspections. It will:

- a. submit to the Secretary such annual or special financial and operations reports as the Secretary may reasonably request and make such reports available to the public; make available to the public at reasonable times and places a report of the airport budget in a format prescribed by the Secretary;
- b. for airport development projects, make the airport and all airport records and documents affecting the airport, including deeds, leases, operation and use

agreements, regulations and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request;

- c. for noise compatibility program projects; make records and documents relating to the project and continued compliance with the terms, conditions, and assurances of the grant agreement including deeds, leases, agreements, regulations, and other instruments, available for inspection by any duly authorized agent of the Secretary upon reasonable request; and
- d. in a format and time prescribed by the Secretary, provide to the Secretary and make available to the public following each of its fiscal years, an annual report listing in detail:
 - (i) all amounts paid by the airport to any other unit of government and the purposes for which each such payment was made; and
 - (ii) all services and property provided by the airport to other units of government and the amount of compensation received for provision of each such service and property.

27. **Use by Government Aircraft.** It will make available all of the facilities of the airport developed with Federal financial assistance and all those usable for landing and takeoff of aircraft to the United States for use by Government aircraft in common with other aircraft at all times without charge, except, if the use by Government aircraft is substantial, charge may be made for a reasonable share, proportional to such use, for the cost of operating and maintaining the facilities used. Unless otherwise determined by the Secretary, or otherwise agreed to by the sponsor and the using agency, substantial use of an airport by Government aircraft will be considered to exist when operations of such aircraft are in excess of those which, in the opinion of the Secretary, would unduly interfere with use of the landing areas by other authorized aircraft, or during any calendar month that-

- a. Five (5) or more Government aircraft are regularly based at the airport or on land adjacent thereto; or
- b. The total number of movements (counting each landing as a movement) of Government aircraft is 300 or more, or the gross accumulative weight of Government aircraft using the airport (the total movement of Government aircraft multiplied by gross weights of such aircraft) is in excess of five million pounds.

28. **Land for Federal Facilities.** It will furnish without cost to the Federal Government for use in connection with any air traffic control or air navigation activities, or weather-reporting and communication activities related to air traffic control, any areas of land or water, or estate therein, or rights in buildings of the sponsor as the Secretary considers necessary or desirable for construction, operation, and maintenance at Federal expense of space or facilities for such purposes. Such areas or any portion thereof will be made available as provided herein within four months after receipt of a written request from the Secretary.

29. **Airport Layout Plan.**

- a. It will keep up to date at all times an airport layout plan of the airport showing (1) boundaries of the airport and all proposed additions thereto, together with the boundaries of all offsite areas owned or controlled by the sponsor for airport purposes and proposed additions thereto; (2) the location and nature of all existing and proposed airport facilities and structures (such as runways, taxiways, aprons, terminal buildings, hangars and roads), including all proposed extensions and reductions of existing airport facilities; and (3) the location of all existing and proposed nonaviation areas and of all existing improvements thereon. Such airport layout plans and each amendment, revision, or modification thereof, shall

be subject to the approval of the Secretary which approval shall be evidenced by the signature of a duly authorized representative of the Secretary on the face of the airport layout plan. The sponsor will not make or permit any changes or alterations in the airport or any of its facilities which are not in conformity with the airport layout plan as approved by the Secretary and which might, in the opinion of the Secretary, adversely affect the safety, utility or efficiency of the airport.

- b. If a change or alteration in the airport or the facilities is made which the Secretary determines adversely affects the safety, utility, or efficiency of any federally owned, leased, or funded property on or off the airport and which is not in conformity with the airport layout plan as approved by the Secretary, the owner or operator will, if requested, by the Secretary (1) eliminate such adverse effect in a manner approved by the Secretary; or (2) bear all costs of relocating such property (or replacement thereof) to a site acceptable to the Secretary and all costs of restoring such property (or replacement thereof) to the level of safety, utility, efficiency, and cost of operation existing before the unapproved change in the airport or its facilities.

- 30. **Civil Rights.** It will comply with such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from funds received from this grant. This assurance obligates the sponsor for the period during which Federal financial assistance is extended to the program, except where Federal financial assistance is to provide, or is in the form of personal property or real property or interest therein or structures or improvements thereon in which case the assurance obligates the sponsor or any transferee for the longer of the following periods: (a) the period during which the property is used for a purpose for which Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits, or (b) the period during which the sponsor retains ownership or possession of the property.

31. **Disposal of Land.**

- a. For land purchased under a grant for airport noise compatibility purposes, it will dispose of the land, when the land is no longer needed for such purposes, at fair market value, at the earliest practicable time. That portion of the proceeds of such disposition which is proportionate to the United States' share of acquisition of such land will, at the discretion of the Secretary, (1) be paid to the Secretary for deposit in the Trust Fund, or (2) be reinvested in an approved noise compatibility project as prescribed by the Secretary, including the purchase of nonresidential buildings or property in the vicinity of residential buildings or property previously purchased by the airport as part of a noise compatibility program.
- b. For land purchased under a grant for airport development purposes (other than noise compatibility), it will, when the land is no longer needed for airport purposes, dispose of such land at fair market value or make available to the Secretary an amount equal to the United States' proportionate share of the fair market value of the land. That portion of the proceeds of such disposition which is proportionate to the United States' share of the cost of acquisition of such land will, (1) upon application to the Secretary, be reinvested in another eligible airport improvement project or projects approved by the Secretary at that airport or within the national airport system, or (2) be paid to the Secretary for deposit in the Trust Fund if no eligible project exists.

- c. Land shall be considered to be needed for airport purposes under this assurance if (1) it may be needed for aeronautical purposes (including runway protection zones) or serve as noise buffer land, and (2) the revenue from interim uses of such land contributes to the financial self-sufficiency of the airport. Further, land purchased with a grant received by an airport operator or owner before December 31, 1987, will be considered to be needed for airport purposes if the Secretary or Federal agency making such grant before December 31, 1987, was notified by the operator or owner of the uses of such land, did not object to such use, and the land continues to be used for that purpose, such use having commenced no later than December 15, 1989.
- d. Disposition of such land under (a) (b) or (c) will be subject to the retention or reservation of any interest or right therein necessary to ensure that such land will only be used for purposes which are compatible with noise levels associated with operation of the airport.

- 32. **Engineering and Design Services.** It will award each contract, or sub-contract for program management, construction management, planning studies, feasibility studies, architectural services, preliminary engineering, design, engineering, surveying, mapping or related services with respect to the project in the same manner as a contract for architectural and engineering services is negotiated under Title IX of the Federal Property and Administrative Services Act of 1949 or an equivalent qualifications-based requirement prescribed for or by the sponsor of the airport.
- 33. **Foreign Market Restrictions.** It will not allow funds provided under this grant to be used to fund any project which uses any product or service of a foreign country during the period in which such foreign country is listed by the United States Trade Representative as denying fair and equitable market opportunities for products and suppliers of the United States in procurement and construction.
- 34. **Policies, Standards, and Specifications.** It will carry out the project in accordance with policies, standards, and specifications approved by the Secretary including but not limited to the advisory circulars listed in the Current FAA Advisory Circulars for AIP projects, dated _____ and included in this grant, and in accordance with applicable state policies, standards, and specifications approved by the Secretary.
- 35. **Relocation and Real Property Acquisition.** (1) It will be guided in acquiring real property, to the greatest extent practicable under State law, by the land acquisition policies in Subpart B of 49 CFR Part 24 and will pay or reimburse property owners for necessary expenses as specified in Subpart B. (2) It will provide a relocation assistance program offering the services described in Subpart C and fair and reasonable relocation payments and assistance to displaced persons as required in Subpart D and E of 49 CFR Part 24. (3) It will make available within a reasonable period of time prior to displacement, comparable replacement dwellings to displaced persons in accordance with Subpart E of 49 CFR Part 24.
- 36. **Access By Intercity Buses.** The airport owner or operator will permit, to the maximum extent practicable, intercity buses or other modes of transportation to have access to the airport, however, it has no obligation to fund special facilities for intercity buses or for other modes of transportation.
- 37. **Disadvantaged Business Enterprises.** The recipient shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The Recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure

non discrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR Part 26, and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801).

38. **Hangar Construction.** If the airport owner or operator and a person who owns an aircraft agree that a hangar is to be constructed at the airport for the aircraft at the aircraft owner's expense, the airport owner or operator will grant to the aircraft owner for the hangar a long term lease that is subject to such terms and conditions on the hangar as the airport owner or operator may impose.

39. **Competitive Access.**

- a. If the airport owner or operator of a medium or large hub airport (as defined in section 47102 of title 49, U.S.C.) has been unable to accommodate one or more requests by an air carrier for access to gates or other facilities at that airport in order to allow the air carrier to provide service to the airport or to expand service at the airport, the airport owner or operator shall transmit a report to the Secretary that:
 1. Describes the requests;
 2. Provides an explanation as to why the requests could not be accommodated; and
 3. Provides a time frame within which, if any, the airport will be able to accommodate the requests.
- b. Such report shall be due on either February 1 or August 1 of each year if the airport has been unable to accommodate the request(s) in the six month period prior to the applicable due date

The first part of the paper discusses the importance of understanding the underlying structure of the data. This is particularly relevant in the context of machine learning, where the ability to identify patterns and relationships in the data is crucial for building accurate models. The authors argue that a deep understanding of the data structure can lead to more effective feature engineering and model selection.

In the second part, the authors explore the challenges associated with high-dimensional data. As the number of features increases, the risk of overfitting also increases, leading to models that perform well on training data but poorly on new, unseen data. To address this issue, the authors propose a regularization technique that penalizes the model for overfitting, thereby improving its generalization performance.

The third part of the paper focuses on the evaluation of machine learning models. The authors emphasize the importance of using appropriate metrics to assess model performance, such as accuracy, precision, and recall. They also discuss the need for cross-validation to ensure that the model's performance is robust and not just a result of overfitting to a specific dataset.

Finally, the authors conclude by discussing the future directions of machine learning research. They highlight the need for more interpretable models and the development of new algorithms that can handle increasingly complex and diverse data types. They also mention the importance of ethical considerations in the application of machine learning, particularly in areas like healthcare and finance.